

LARGE INTEREST IN CANAL WORK

Commission Will Provide and Own Most of the Machinery.

MITCHELL WAS HARDHEADED

Reason For His Resignation At Last Has Been Made Public.

(Special Correspondence of The Times-Dispatch.)

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COLON, PANAMA, December 30.—One has only to look over the scene of future operations at Panama, and inspect the gigantic machines left strewn along the swamps by the Frenchmen to appreciate the enormous interest the work will have from an engineering standpoint. New records will be established; new methods introduced; new inventions and machines tested and new theories proven—all of which will be of greater importance to the engineering lore of the world than any enterprise ever yet undertaken by man.

New machines, costing thousands and thousands of dollars, have commenced arriving at Colon already, and several are being unloaded at the wharves. During the past few days, the Frenchmen have been most every point of view, the De Lesseps enterprise taught engineers a great deal of the use of machinery, and the best types to be employed under such conditions as those existing here, and the writer notes with satisfaction the willingness of the American engineers to avail themselves of the knowledge thus gained. Much of the machinery abandoned by the French company is being repaired, and will be brought into use throughout the construction of the great ditch.

Heavy American Cars.

The hundreds of small French locomotives are to be utilized, and, indeed, these are the subject of much approving comment by our engineers, the detail of the workmanship of them being regarded as better than that required by American practice. The steel cars used by the French for handling dirt prove too light, however, for use with American steam shovels. They will not stand the repeated dropping of several tons of rock at a time, and will be replaced with heavier American cars.

Many of the French dredging machines will be used, though of a type unfamiliar on this continent. An endless chain carrying a row of buckets, that scoop up the loose earth as they are dragged up a bank, is the principle upon which most of these foreign machines work. Some of them are so enormous in size that they cost a half to three-quarters of a million dollars. They will do a great deal of work, but are not regarded with much favor by Americans, who prefer smaller machines, that can be handled more quickly. The Suez type of dredges are being, however, and will be used in the Panama canal. One of these (shown in illustration) is known as a double centrifugal machine and cost \$500,000 francs. Such of the foreign dredges as are in fair order are being repaired and will be used for dredging the harbors, the approaches, and the swamp regions, being supplemented with American machines. Up to June 15th of the present year, twenty-nine steam shovels all of the Bucyrus type, had been ordered, also three large wrecking cranes, all of United States manufacture.

Proves Good Labor.

The commission will provide and own most of the machinery, partly because it was necessary to buy the French machines on the spot, and partly because American contractors would be loath to make heavy machinery investments for such distant employment. Nearly all the actual work of digging and dredging will be done by contract under the commission's engineers, and the various types of machinery will be used in the work. There have also been ordered two of the largest steam shovels ever made, thirty-five tons weight, and one of these has a record of over 800 cubic yards, removed in one hour, the enormous dipper picking up five yards of earth in one order to form a better idea of what rapid work this is, let us compare it with manual labor. One good man, with a good shovel, can dig about a yard of rock out of a bank and throw it in a car in one hour; therefore, this great shovel, with a crew of only a few men, will do the work of 800 men, and it will be to do the work of 800 laborers in the year around.

Where the digging is shallow the old system of coble-ways, as used on the Chicago drainage canal, will be employed to some extent.

Typical American Machine.

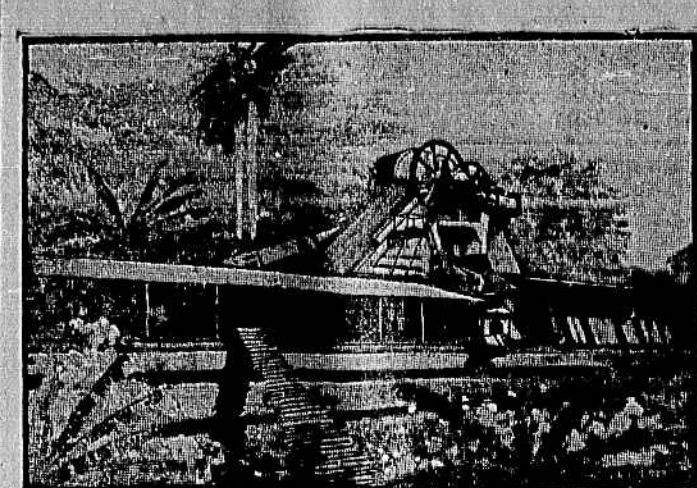
The earth-spreader is another typical American machine, of which a number are being ordered for the isthmus. The largest size, weighing 100,000 pounds, will do the work of 1,000 men and consists of a heavy flat car, bearing a powerful engine and operative mechanism, and carrying a great wing of spreader on each side. It runs along a track, and the spreader levels the pile of earth that has been dumped on the side.

It is not the intention of the writer to enter into a discussion of the merits of any controversy which has arisen out of the Panama Canal operations, but right here might be a good place to call attention to the manner in which more recent developments have vindicated the action of Chief Engineer John F. Wallace, criticized though it was.

The practical adoption of his scheme of building the canal by private contractors by the Washington officials is a simple testimony to its excellence, and the conditions at the isthmus as they appear to me, coupled with a personal knowledge of the opposition, and taught at the capital, justify his action in the favor of the writer, and it is apparent to one who has visited the isthmus and listened to the sentiment of the men who worked there under his regime, that he had not been interfered with by political and selfish interests, he would still be in charge of the work.

Why He Resigned.

The absolute impossibility of building the canal in a manner to conform to the various ideas of the American public, and the chaotic conditions created by official red tape, were enough to disgust, although not discourage, such a man as this, whose hard-headed judgment in such matters was for him the appointment in the first place. He wanted a



SOME OF THE HEAVY MACHINERY USED IN THE CANAL WORK.

free hand to manage things as they should be managed, and being practically denied this he resigned.

Whether the canal shall be built by the government itself or shall be sub-let to contractors is a question as yet undecided. At present it appears probable that the latter method will be selected, though no one can tell how far official candor will go.

The immense success of this plan in the construction of the Chicago drainage canal recommends it strongly to the consideration of Panama authorities, as it is the cheapest and most expeditious method possible under average conditions. The scheme is to divide the route up into sections, about 2 1/2 miles long, and let each section to a private contractor, who shall furnish and care for his own men. If this arrangement is adopted, which at present seems extremely probable, the work of making the great ditch will be divided into sections, and the government will be withheld from the general plan and performed by the government itself.

In any event, the present organization will retain control over the work, and the chief engineers, under John Stevens, will direct the work of the sub-contractors. In this way a canal, conforming to the ideas of the most eminent engineers of modern times, can be dug at a cost of less than \$100,000,000, and there is little doubt of the commission advertising for bids as soon as the engineering plans are completed.

When Will We Have a Canal?

How much time will be required to build the canal? This question is often asked, and cannot be answered with entire satisfaction or any degree of certainty. It is possible, however, to figure how long it may take. Let us assume that the Cuban cut is to be reduced to the sea level, and that the remainder of the work can be completed by the time this tremendous ditch is finished. In addition to the work already done at Culebra, there remain in this section of territory 100,000,000 cubic yards of earth and rock to be removed, or the equivalent of the total removal at Suez. About thirty-five average steam shovels could work on this division without interference. Working on one shift, ten hours a day, and making due allowances for stoppages, accidents and delays usual to large contract work, they should average 100,000 yards per shovel, or, say, 10,000,000 cubic yards a year for the thirty-five shovels. With two shifts they could double this speed.

It will be at least a year before thirty-five shovels can be set to work; two years more may expire before the lighting system will be in order to permit of double shifts. Therefore, the best that can be hoped for is about 25,000,000 yards removal in the next three years, and 20,000,000 per year afterwards, or a total of seven years of cutting with the steam shovels, supplemented by two years of work in completing the canal ready for transportation. This would make 1913 the earliest date at which the canal could be completed, and some enthusiasts have declared that it will be opened in that year. But these do not reckon with serious accidents and interferences, which are practically certain, not to mention the dreadful yellow fever, which has heretofore proved the chief obstacle to the work, and which, whose ravages no practical remedy has even been suggested. Conservative men say that the commission will do remarkably well if they are able to complete the canal by 1917, and that there should be no cause of complaint if it is not finished before 1920.

Competition in Ten Years.

In opposition to this is the opinion of certain eminent engineers, notably Isham Randolph, who built the Chicago drainage canal, and who thinks the great work will be completed in ten years. Mr. Randolph has taken into account the possibility of accidents, and made allowance for them, and his estimate is accepted as fairly accurate by expert engineers who have overlooked the ground.

That efforts will be passing through the Panama Canal in 1915 seems possible to many, and some say it is a sure thing, but I doubt it.

The Financial End.

Up to the present moment the Panama Canal has cost the United States \$20,000,000, of which \$10,000,000 has been spent on the rights and property of the French company, \$10,000,000 to satisfy the Republic of Panama, and the remaining \$10,000,000 has been spent, or almost spent, in the work on the isthmus. Just how this \$10,000,000 has fared away without any charged against "excavation." Altogether, up to June 1st, \$4,000,000 had been expended, of which seventeen per cent, or \$684,202 went for the expense of actual construction. Of the \$3,315,800 which the United States has expended for the canal, \$1,312,200 was for the special commissioners appointed to assist the regular commission in making up their minds what to do, and \$5,783 went to the office of the Committee on Engineering. The rest was divided as follows: Department of administration, \$1,124,920; department of government and sanitation, \$67,805; department of construction and engineering, \$233,010; for sanitation, \$208,641; hospitals and asylums, \$133,825; construction of water works, power and roads, \$190,088; police and prison, \$97,694; machine shop expenses, \$167,641; repairs to equipment, \$76,524; construction and repairs to build-

ings, \$805,100; purchase of shops and lands, \$54,716; purchase of Panama Railroad stock, \$156,657.

The probable expense of completing the canal can be calculated approximately. The former Isthmian Canal Commission estimated that the rock and earth removal would cost \$80 cents a yard. Actual work in Culebra the past year shows that the cost will be only 50 cents a yard, so that the simple digging of this greatest ditch in the world will involve an expenditure of \$120,000,000 if carried to sea level, and about \$50,000,000 if the canal is constructed with locks.

Harbor dredging has been done in the United States in many places for nine cents a yard, or even less, but at such a distance and under the conditions that will govern work at Panama, it may well cost 25 cents a yard. The test borings have been sufficiently extensive at this time to show to practical men about what is to be encountered in both harbor dredging and swamp dredging, and, therefore, these costs are known with a close approach to accuracy. However, a great part of the expense may come with the unforgivable conditions growing out of yellow fever epidemics and general demoralization of both laborers, contractors and the engineering corps.

The total estimates of the cost of the canal have varied from a hundred and fifty to two hundred and fifty million according to the plan, while the Congressional appropriation is \$140,000,000, an amount generally agreed to be insufficient. Probably Congress thought it well not to begin by appropriating too liberally, as such works always seem to exceed the appropriations. The chances are that before the work is done \$100,000,000 will have to be raised in addition to the appropriation, whether the canal is built at sea level, or the elevated section through the Cordilleras.

A Popular Bond Issue.

It is possible that this vast sum of money will not be taken bodily from the national treasury. A popular bond issue of \$100,000,000 has been suggested, and it is likely that such a plan could be adopted satisfactorily. Financiers would be anxious to get hold of these bonds and the entire issue would sell at a great advance. The Spanish-American war, upon which the original appropriation of \$60,000,000 was made, authorized a bond issue of \$100,000,000 in gold bonds, and that this may be made a popular loan, the demand of the securities has been fixed at \$100,000,000.

An appropriation of \$100,000,000 would be a serious drain on the national coffers, and it has been suggested that the first proceeds of such a bond sale be devoted to paying the Spanish-American war debt, and the balance to be used for the canal. The original appropriation of \$60,000,000 would place part of the burden of the canal bonds on a future generation, and would be but just, since that generation would reap the fullest benefit from the canal project. The bond clauses of the Spooner act contains all the money derived from the sale of canal bonds, and all expenditures on account of the canal, and it is believed that the making good of the deficit in the treasury caused by the original appropriation in this manner is within the power of the government.

A review of the entire project, as it stands today, gives one a faith that America will add one more laurel to the national brow, by completing this truly stupendous work, and thus multiplying the world's commerce. Let us hope that it may be accomplished without any of the financial scandals that swamped the previous undertaking, and that, as a result, it will be a source of much money to the nation, by completing this truly stupendous work, and thus multiplying the world's commerce. Let us hope that it may be accomplished without any of the financial scandals that swamped the previous undertaking, and that, as a result, it will be a source of much money to the nation, by completing this truly stupendous work, and thus multiplying the world's commerce.

THE TORRENS SYSTEM.

Both Friends and Opponents of Measure in Radford.

(Special to The Times-Dispatch.)

RADFORD, VA., December 30.—The Torrens bill has both friends and opponents in Radford. Captain John G. Osborne, one of the most intelligent and level-headed men in this section, heartily endorses it, and Judge Cassell, of the Circuit Court, wishes to see it become a law with certain amendments. Judge Helden Longley and Mr. Robert L. Jordan, Commonwealth's attorney for Radford, are opposed to the bill. Colonel Helden Longley, a newspaper editor, and Warner J. Alexander, postmaster and formerly agent for a big Philadelphia land company, says that he would be in favor of the measure but for the clause which makes it necessary to make a trip to Richmond in order to establish title to property under dispute. That is one of the objections urged against it by Judge Longley. He says the passage of the bill would prove a feast for the lawyers, as there would be much litigation for years. He also claims that it would not suit country people, whose land is not laid out in squares, but in the most irregular forms, though it might be adapted to the cities.

Ex-Governor Tyler has the following to say of the measure:

"I regret that a pressure of engage-

ments has prevented me from giving an earlier reply to your request for my views on the 'Torrens System,' and for this reason I have not been able to give as much time to the study of such a question as I should, before venturing to express my opinion.

"I had formed rather a favorable opinion of the measure from what I had heard of it in a general way; but I confess, after reading the bill and some able opinions, both for and against it, that I have fears that it will not prove as effective as is claimed for it.

"I am not a lawyer, and therefore will not venture to discuss the bill from a legal standpoint. This part will be attended to by the members of the legal fraternity; but as a citizen earnestly desiring the welfare of my State, I venture to express the opinion that any measure which proposes to make such a complete revolution in our land registry (or title) system may well excite apprehension.

"The flame of fire in every revolution is easier to kindle than to quench, and an injurious bill is more easily defeated

than a beneficial one.

"I am, Sir, very respectfully,

Yours very truly,

Wm. W. Tyler.

Radford, Va., Dec. 29, 1905.

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